Process to Identify High Priority Corridors for Access Management Near Large Urban Areas in Iowa

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Presentation Outline

- Current Iowa DOT access classification system and map
- Research project goals
- Research methodology
- Results of ranking process
- Top ranked potential Improvement corridors
- “Proactive corridor” identification process
- Next steps: implementing corridor management

Preface

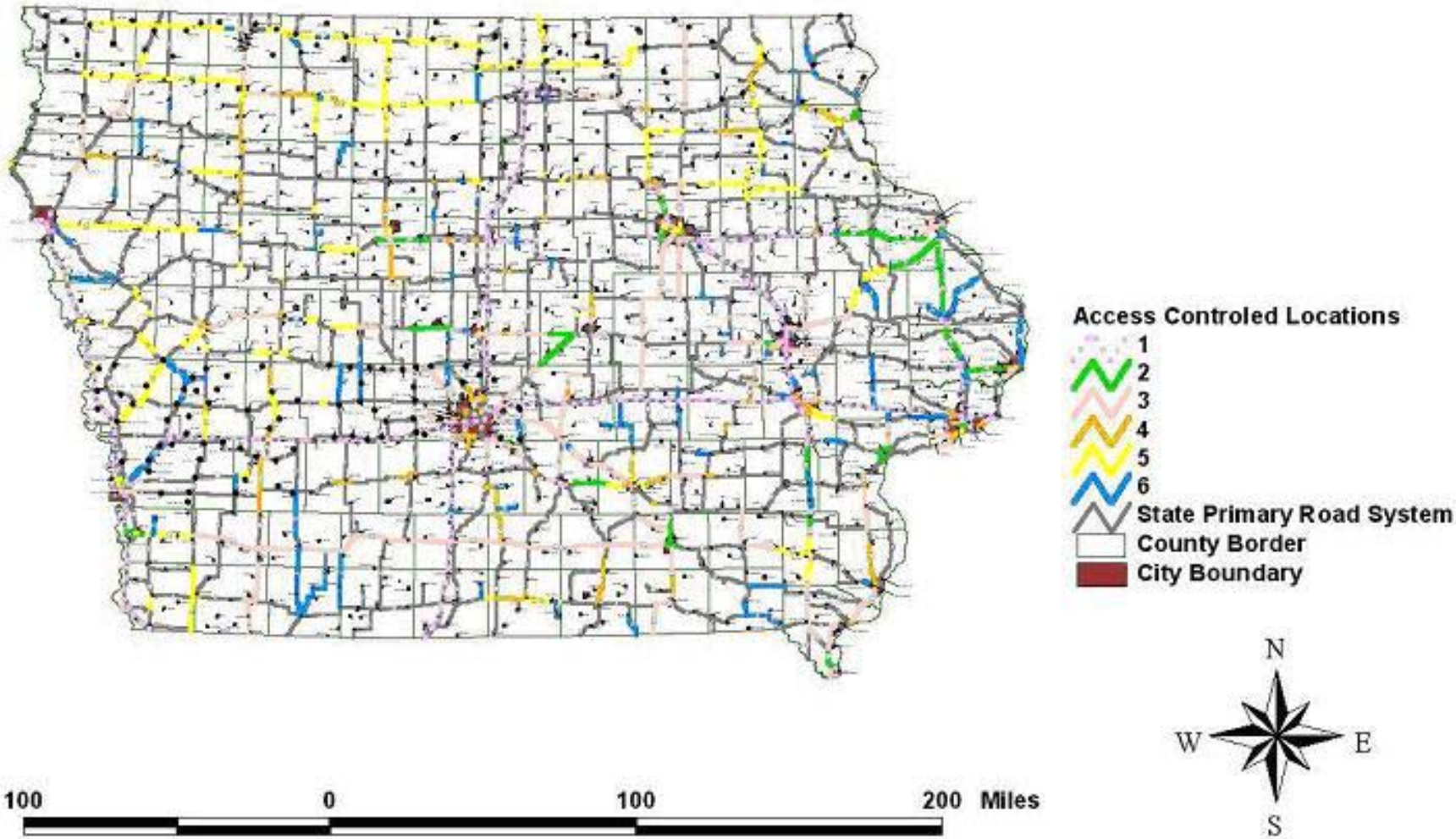
- This research was funded by the Iowa Department of Transportation's Office of Traffic and Safety
- Iowa DOT funding was matched partially through the Midwest Transportation Consortium, the University Transportation Center serving Iowa, Kansas, Missouri, and Nebraska

Iowa DOT Access Priority Ratings (English Conversion From Metric)

Rating	Description
1	Access points at interchanges only
2	Access points spaced at minimum 2625 ft
3	Access points spaced at minimum 984 ft rural, 656 ft urban
4	Access points spaced at minimum 656 ft rural, 328 ft urban
5	Iowa DOT has minimum access rights acquired
6	Iowa DOT has acquired no access rights

Source: Iowa DOT.

State of Iowa: High Priority Access Classifications

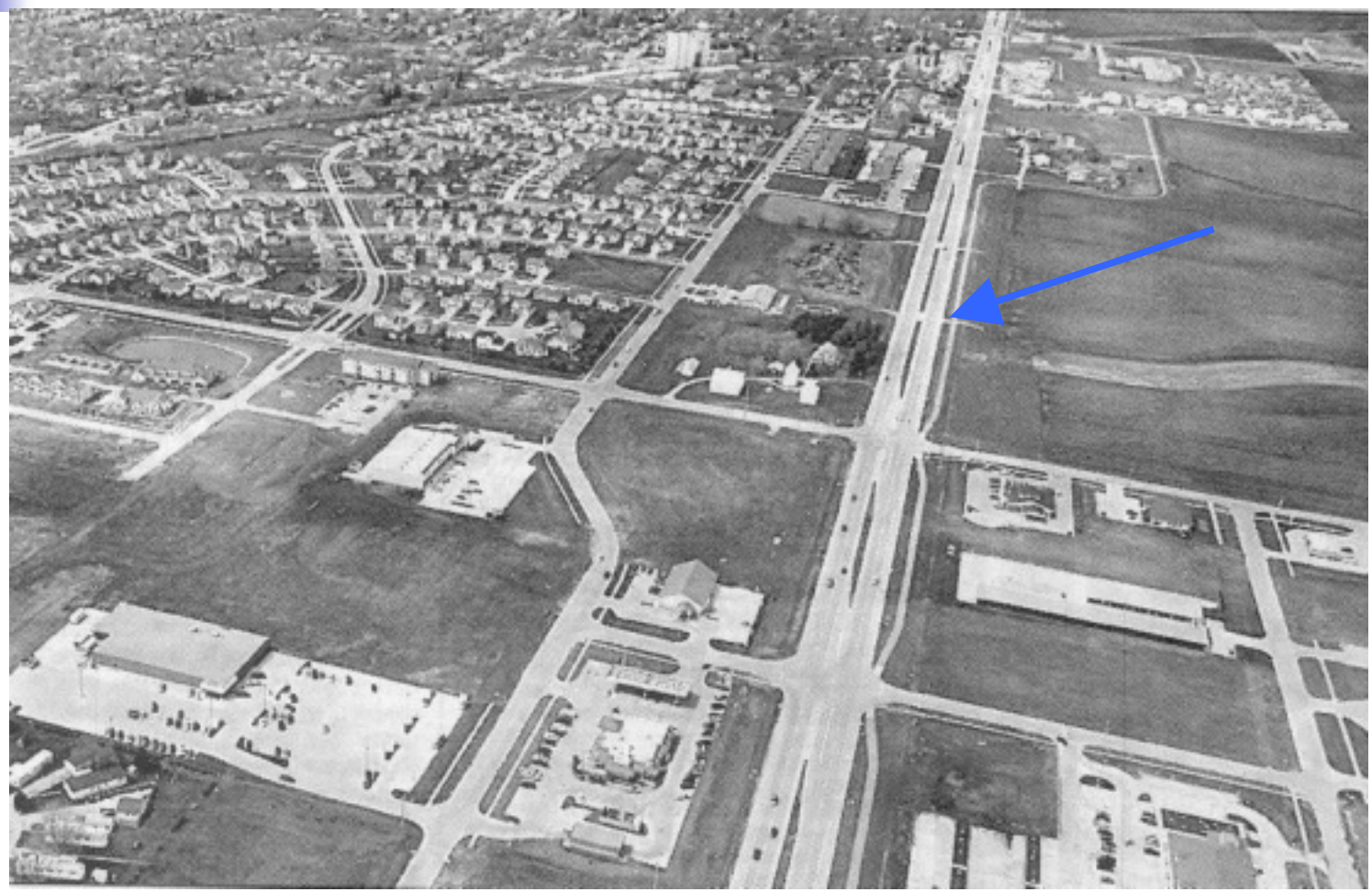


Research Project Goals

- This research project was intended to produce a strategy for addressing current and future access management problems on state highway routes located just outside urban areas that serve as major routes for commuting into and out of major employment centers in Iowa

- There were two main goals for the project:
  - Develop a ranking system for identifying high-priority segments for access management treatments on primary highways outside metro and urban areas.
  - Focus efforts on routes that are major commuting routes at present and in the future, especially four-lane expressways

Example Commuting Corridor: US 6 West Of The Des Moines Metropolitan Area

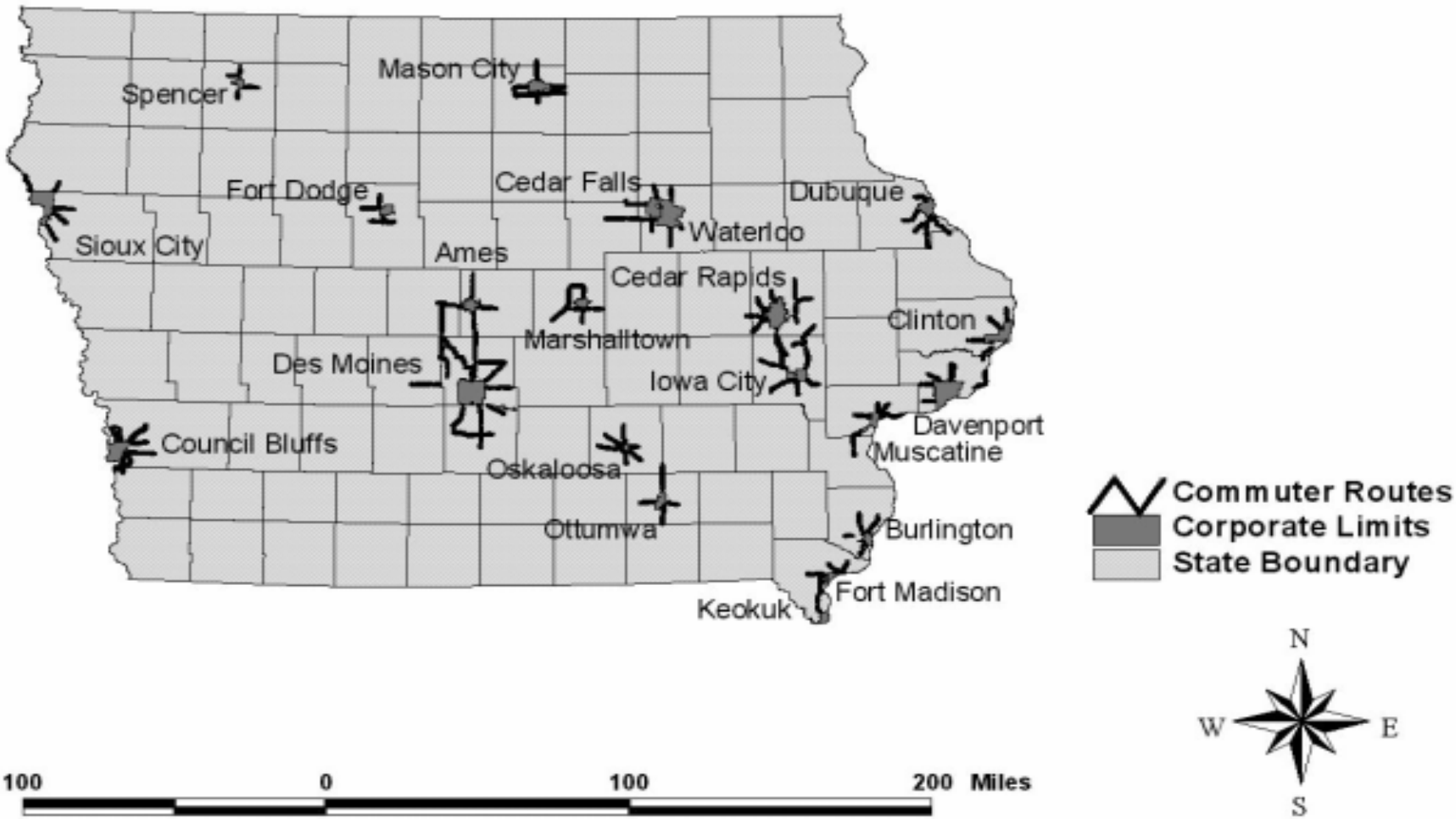


Methodology: Technologies Used

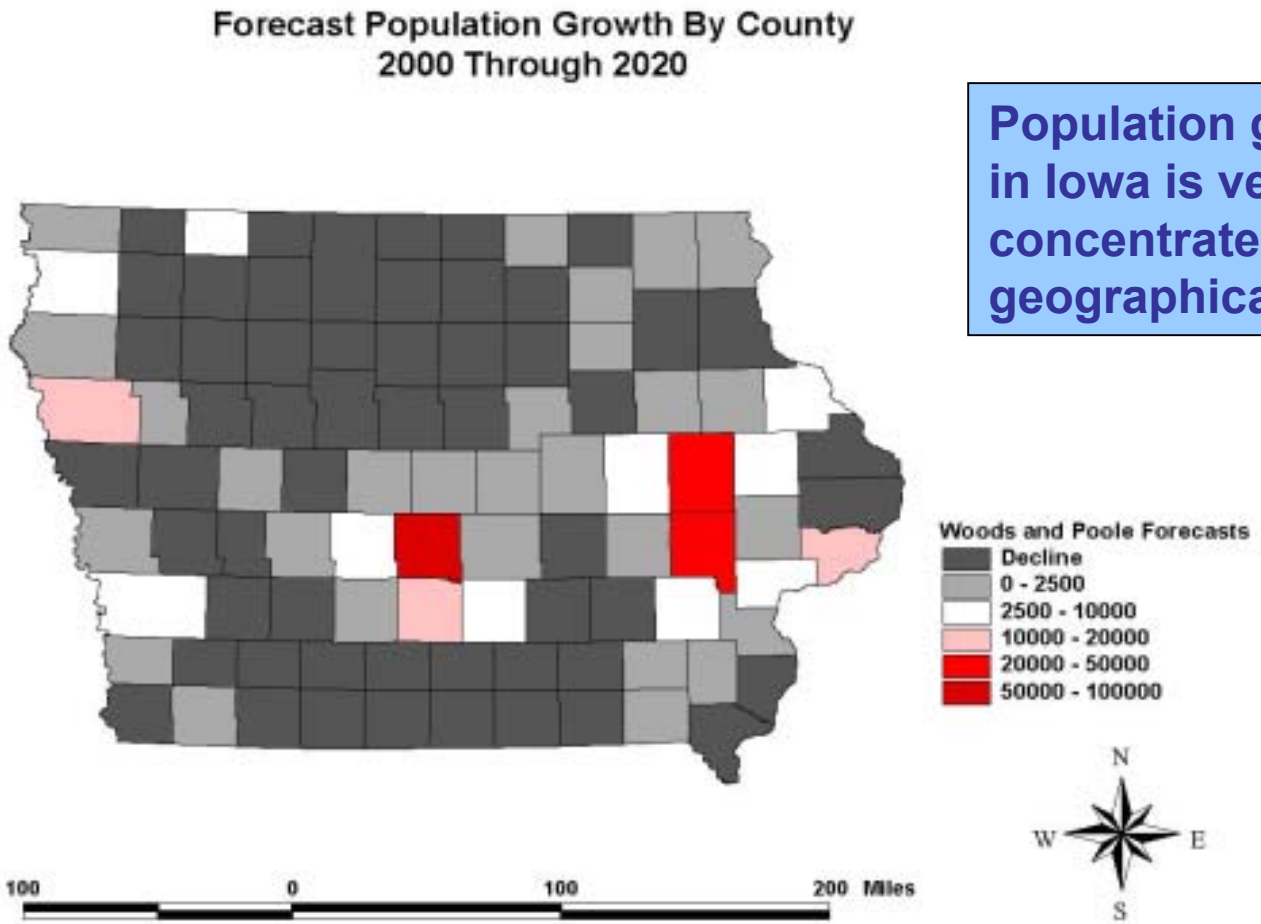
- A geographic information system (Arc View GIS) was used to integrate various Iowa DOT databases, including roadway characteristics, traffic, and crash records
  - Crash records used were from 1997-1999

- A large (2940 zone) traffic model was developed using TRANPLAN software to estimate current and forecast future commuting activity on all Iowa DOT Primary routes
  - Results were visualized using CTRE's TRANPLAN/Arc View interface program

State of Iowa Commuter Routes

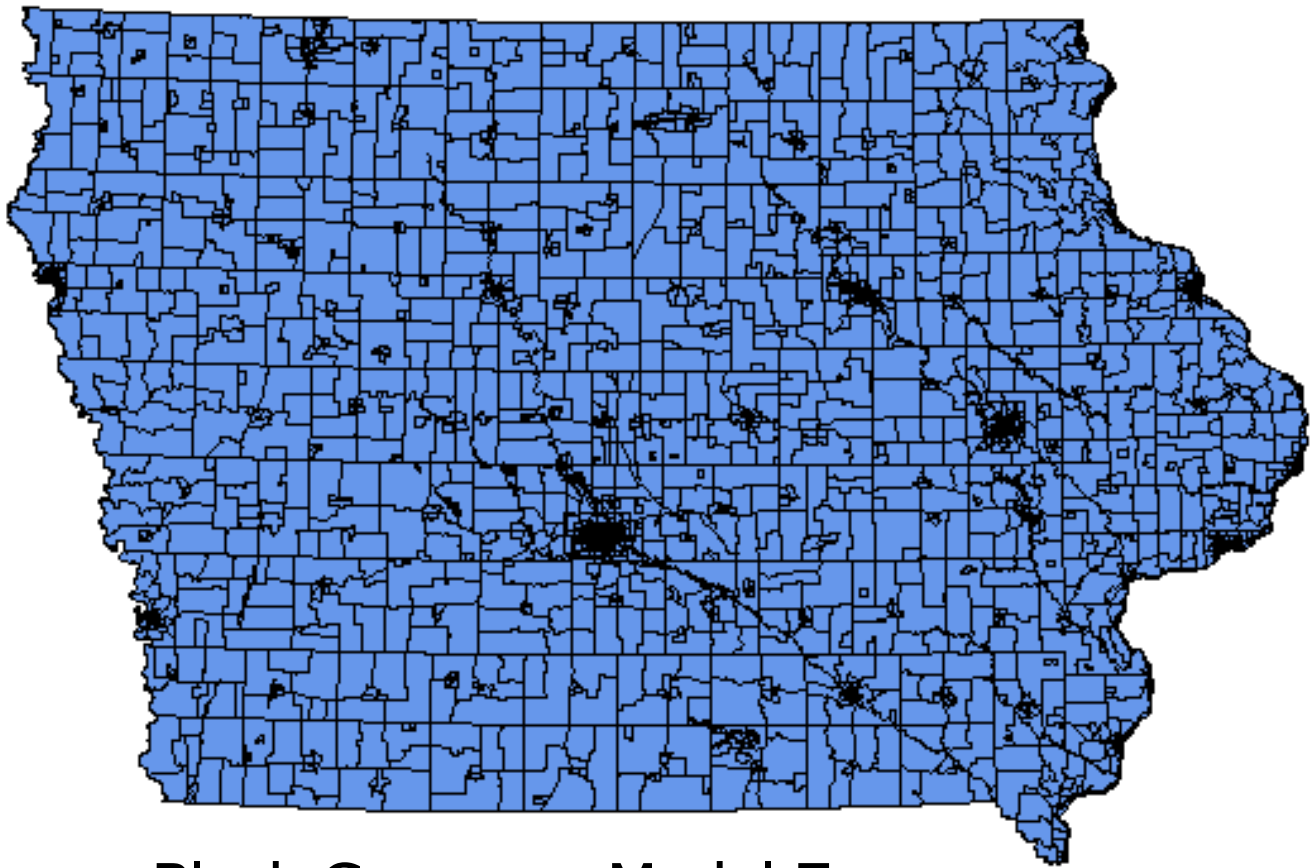


Iowa Forecast Population Growth By County



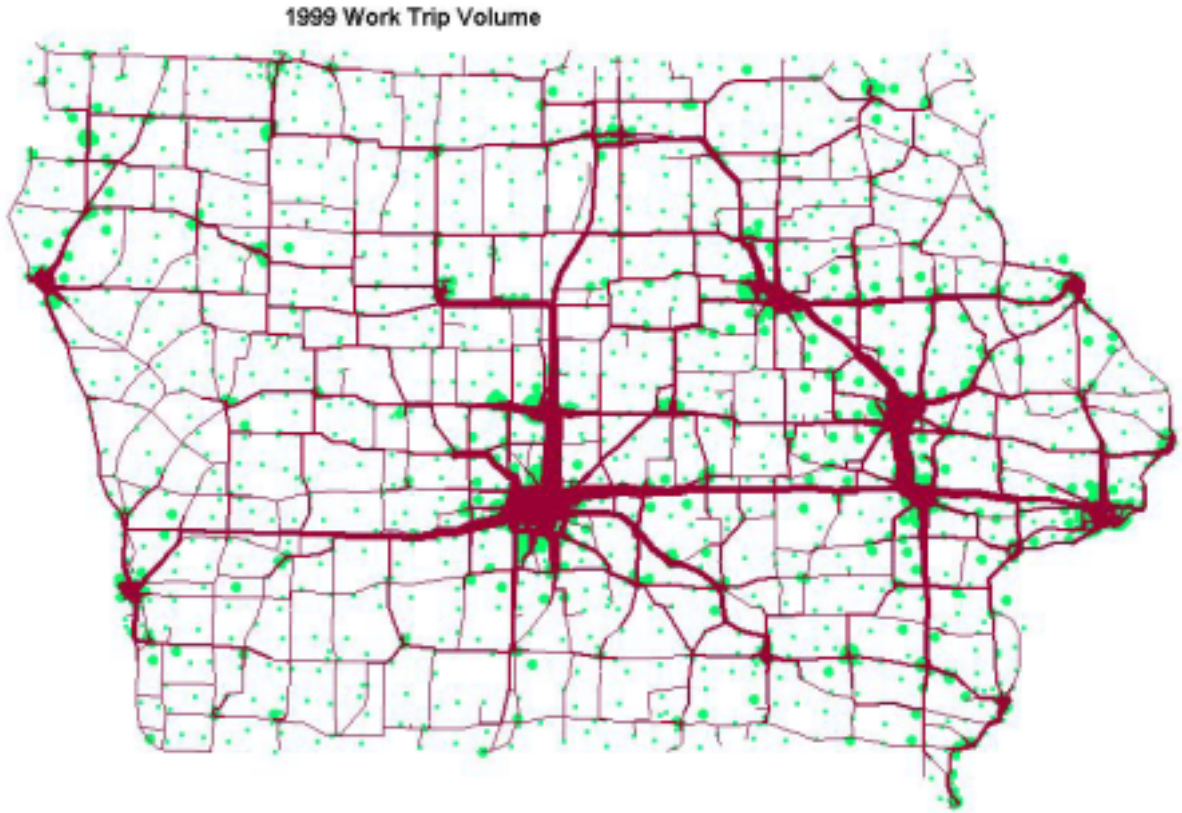
Population growth in Iowa is very concentrated geographically

Traffic Model Zone Structure

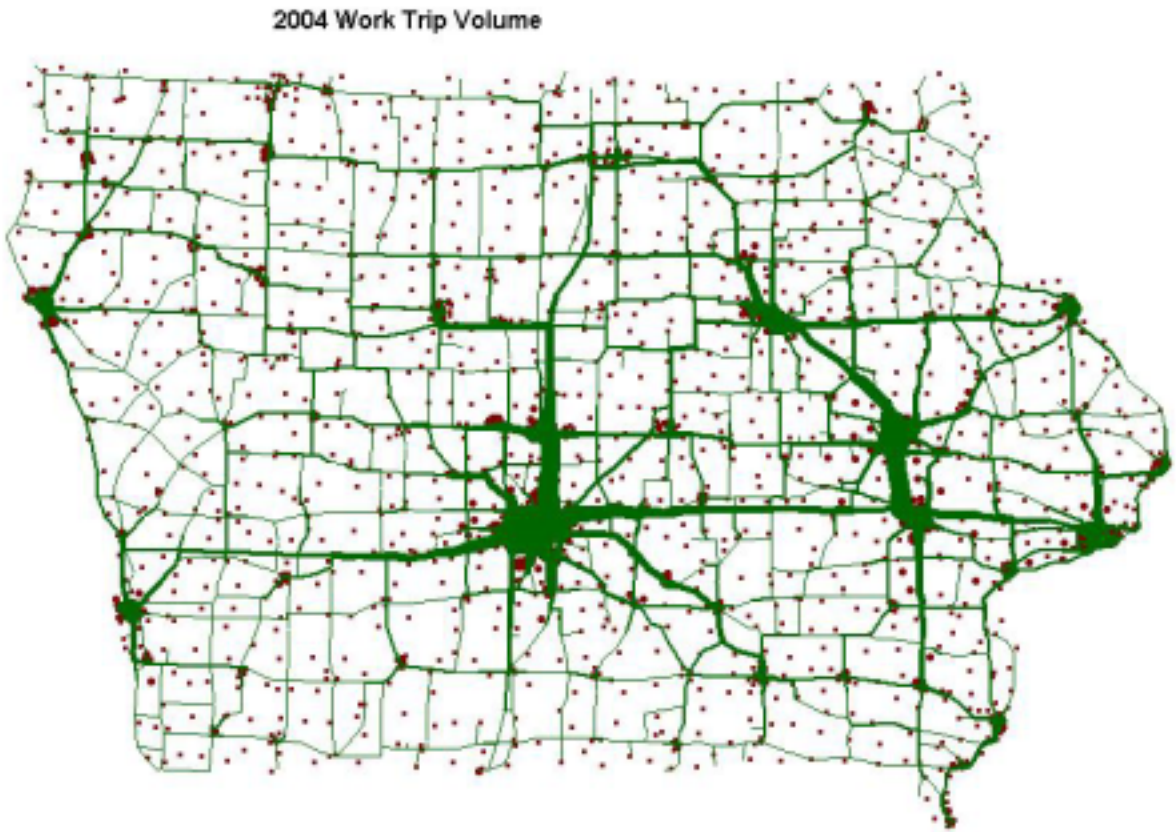


2940 Census Block Groups = Model Zones

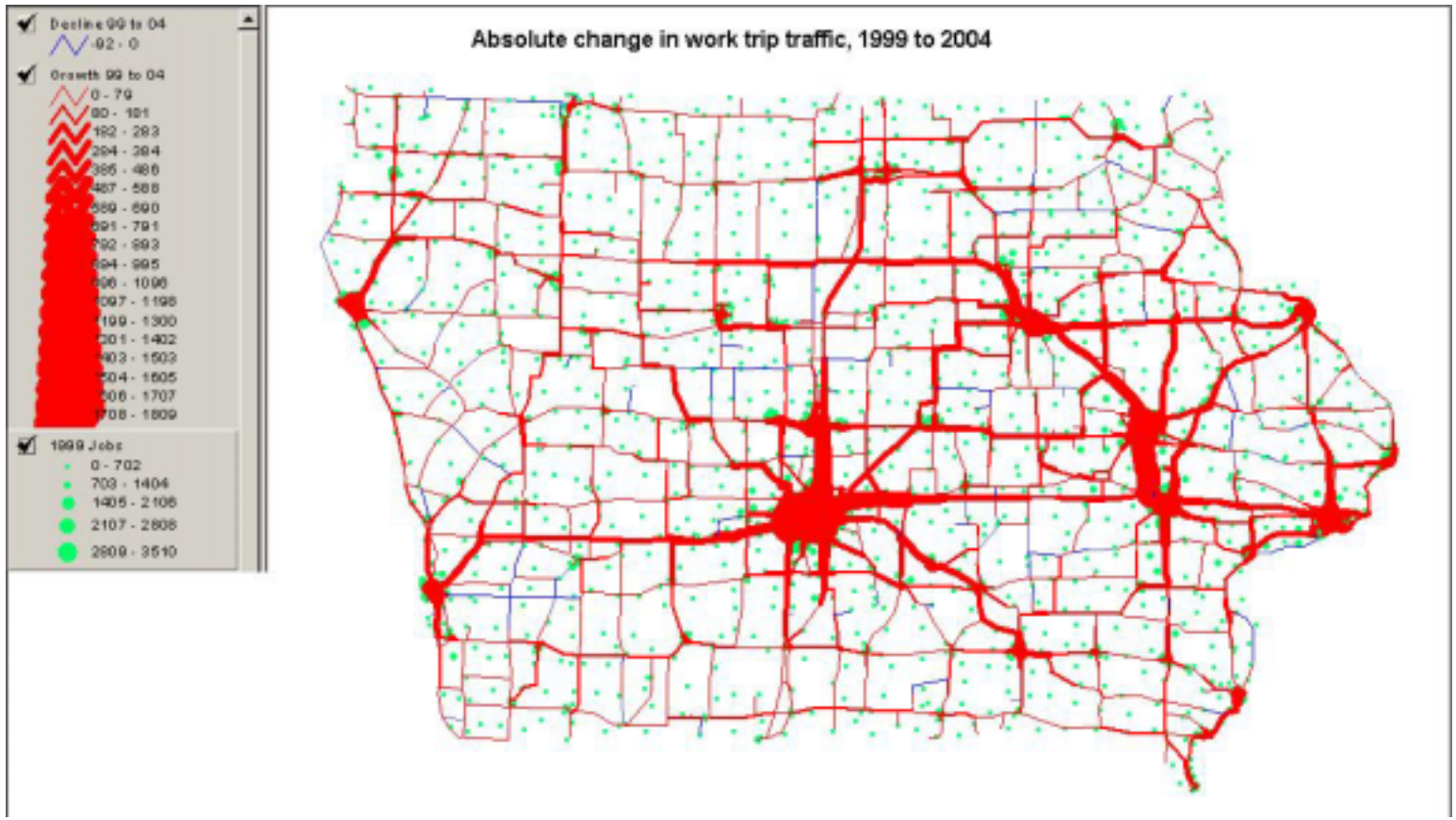
1999 Estimated Commuting Trip Volume From Model



2004 Estimated Commuting Trip Volume From Model



Forecast Absolute Change In Commuting, 1999-2004



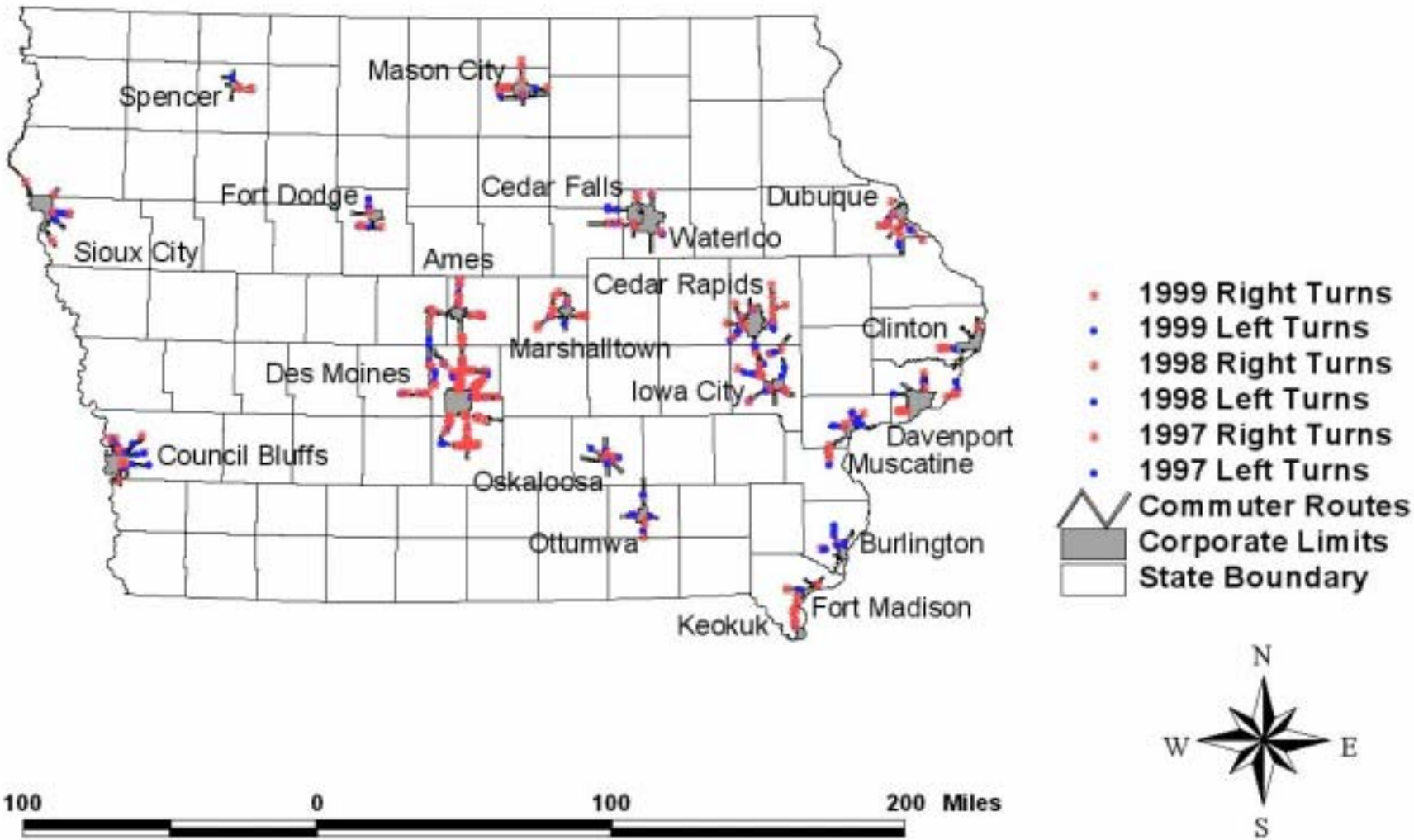
Forecast Percentage Change In Commuting, 1999-2004

Access-Related Crashes Included In The Analysis

Collision Code*	Description
4	Rear-end/right-turn collision
5	Rear-end/left-turn collision
12	Broadside/right-angle collision
13	Broadside/right-entering collision
14	Broadside/left-entering collision

*From Iowa DOT ALAS database

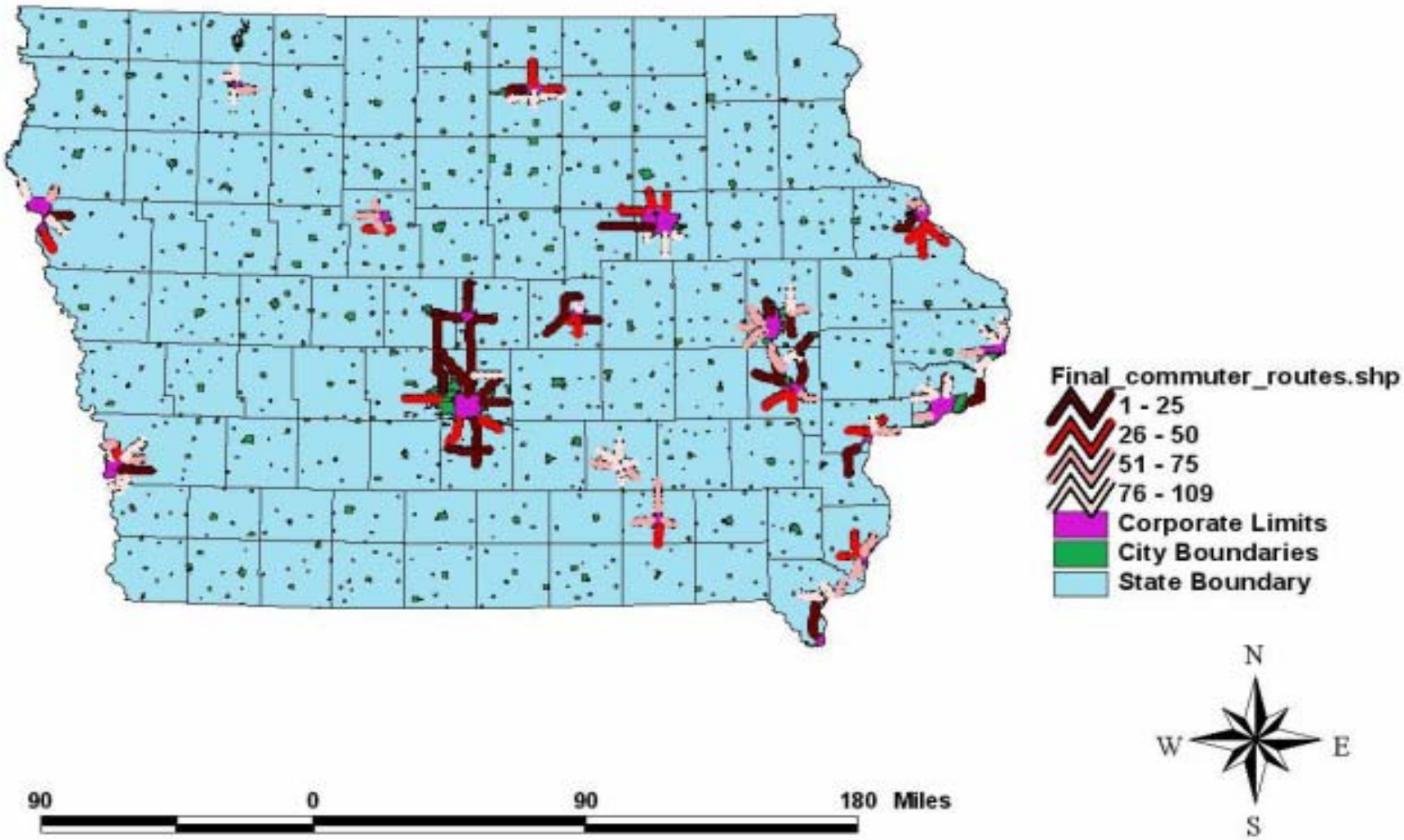
Iowa Commuter Routes: Access-Related Crashes



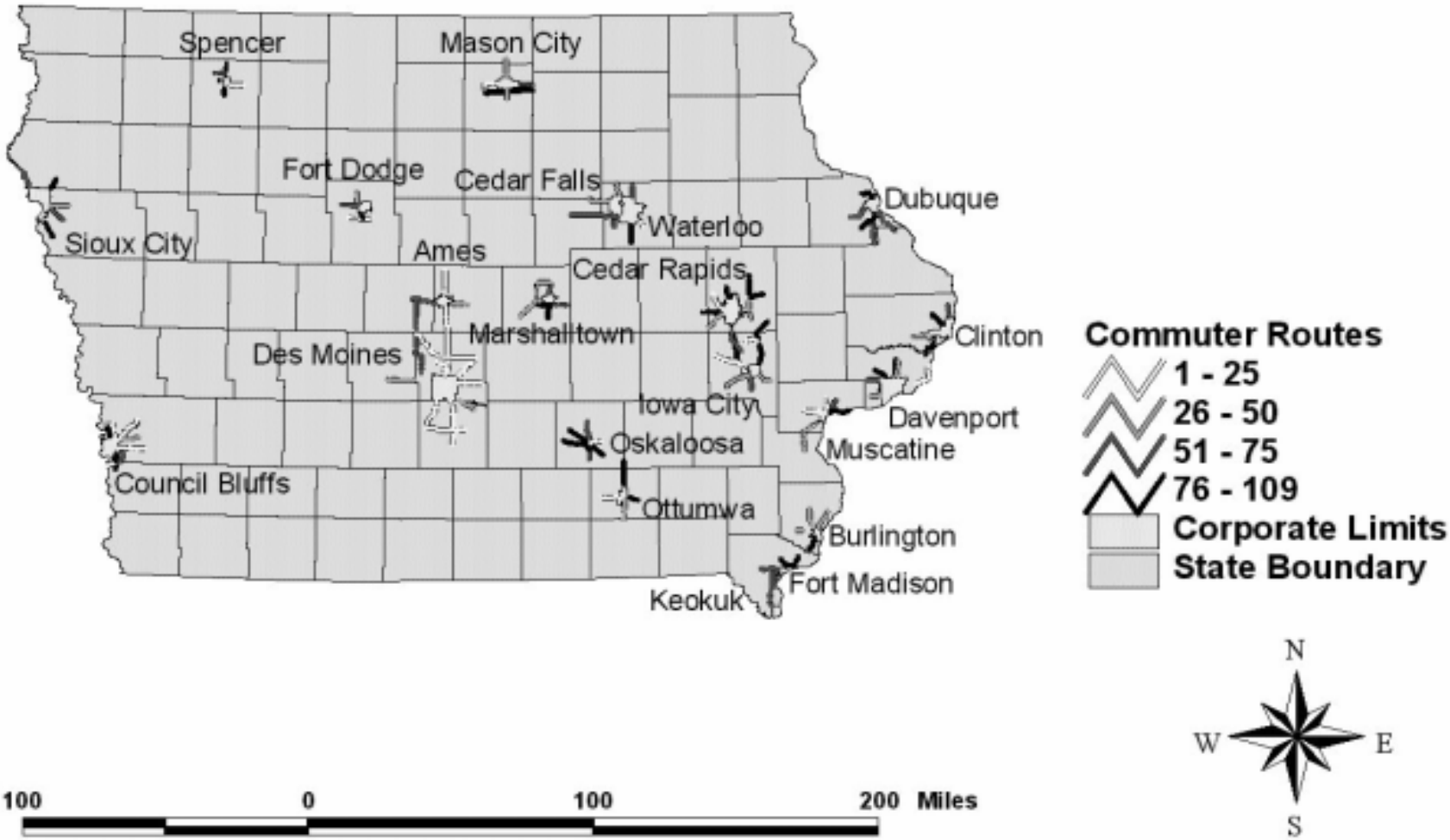
Ranking Factors Used

- **Frequency**—This indicator represents the number of crashes that appear to be access related, in particular those that involve turning vehicles. All turning crashes were included, whether they occurred at private driveways or public road intersections.
- **Rate**—This indicator is the frequency of access-related crashes per million vehicle miles traveled (VMT).
- **Loss/severity**—This indicator measures the estimated cost of access-related crashes in dollars, including an estimate of the cost of fatalities, personal injuries, and property damage.
- **Percentage access related**—This indicator represents the percentage of total crashes that appear to be access related.

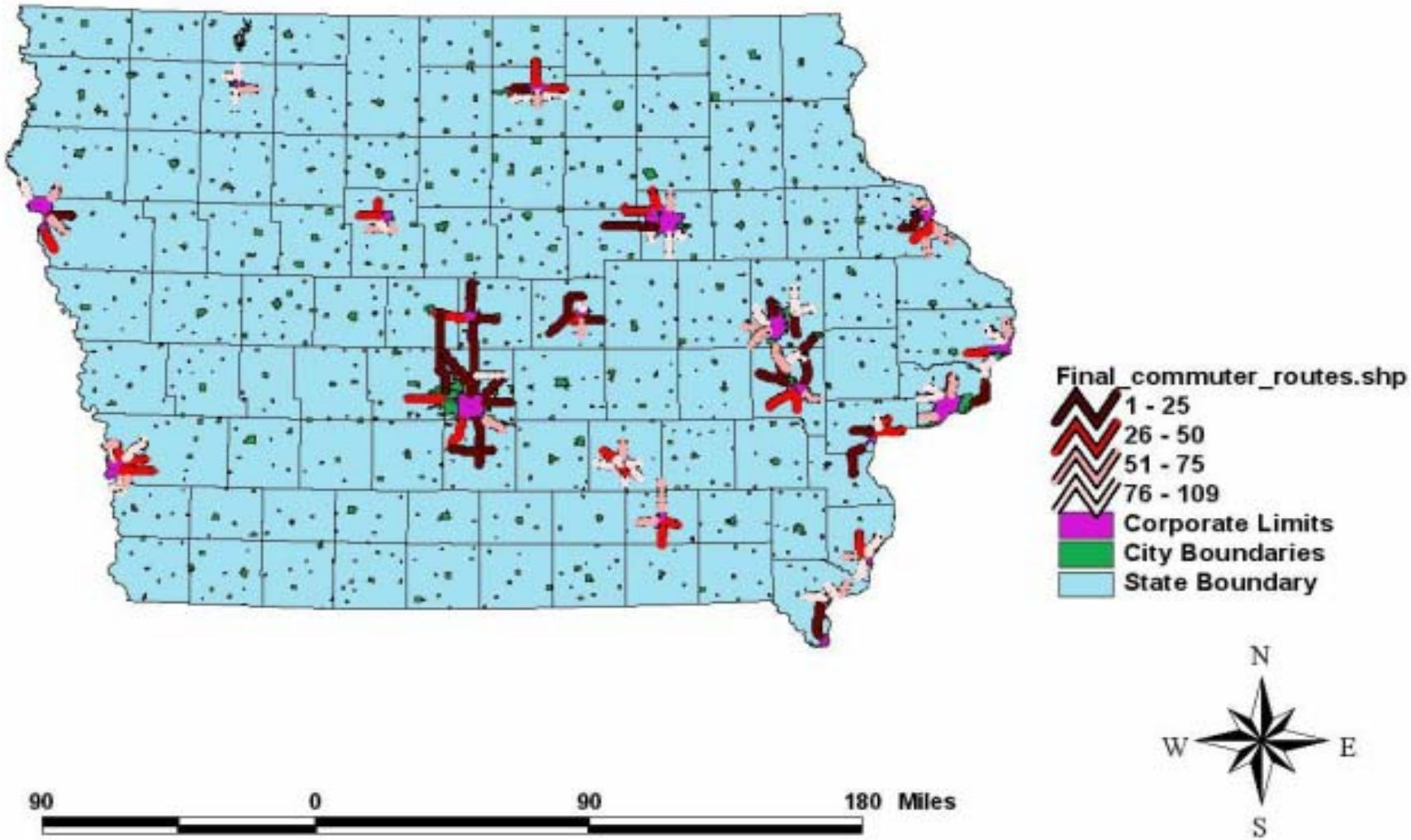
Iowa Commuter Routes: Frequency Rankings



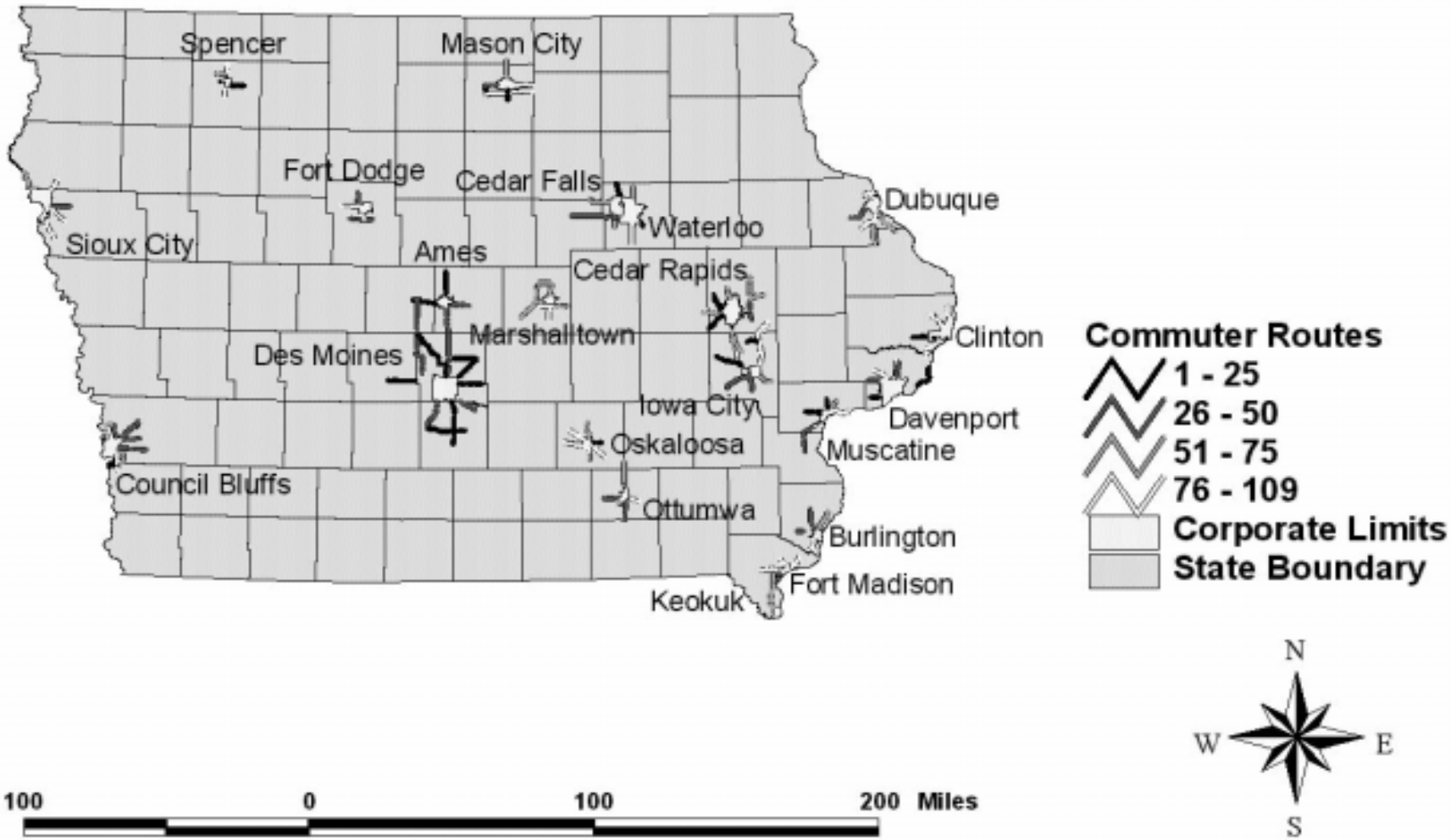
Ranked Commuter Routes by Access-Related Crash Rate



Iowa Commuter Routes: Loss Rankings



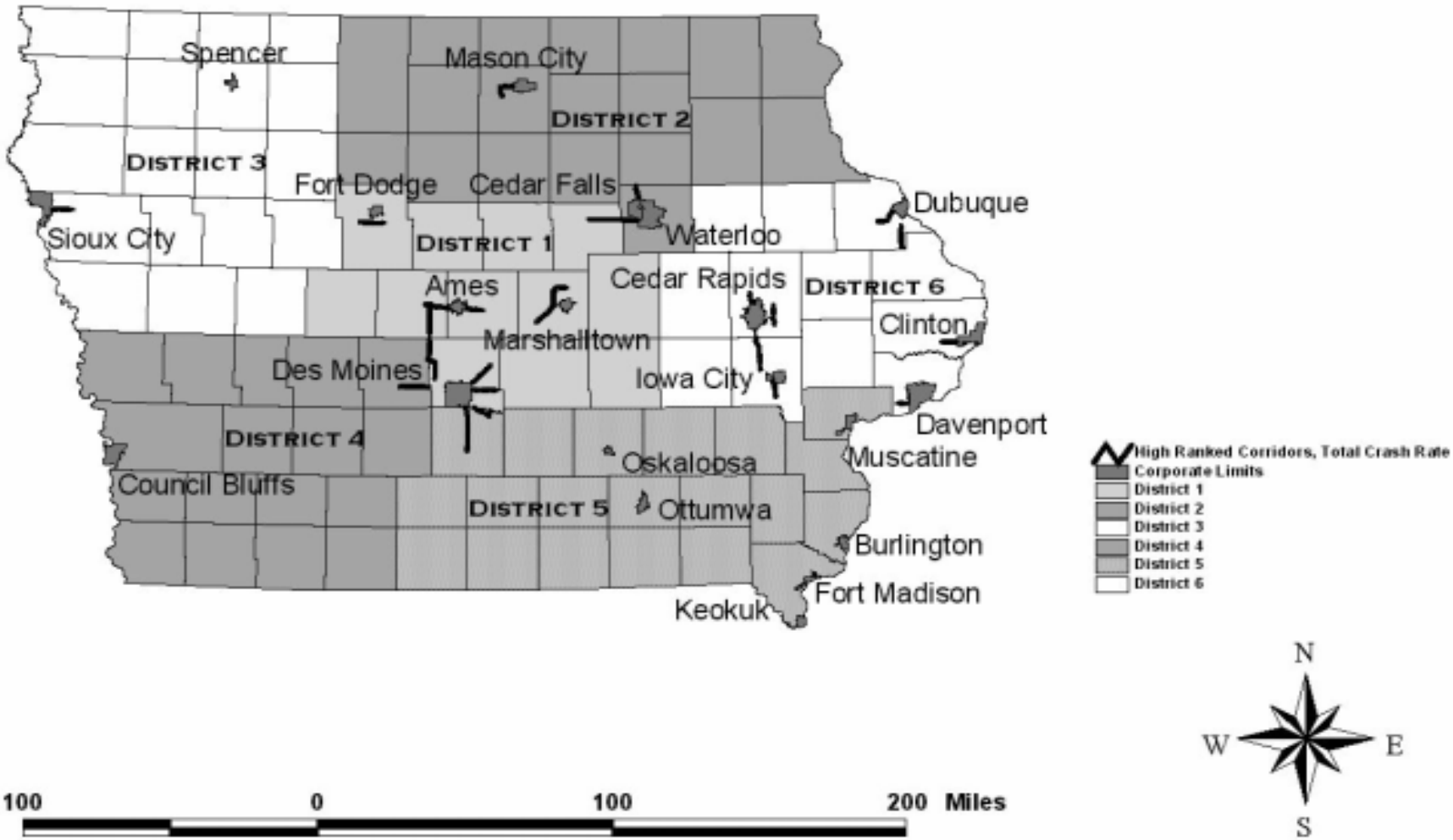
Ranked Commuter Routes by Percentage of Access-Related Crashes



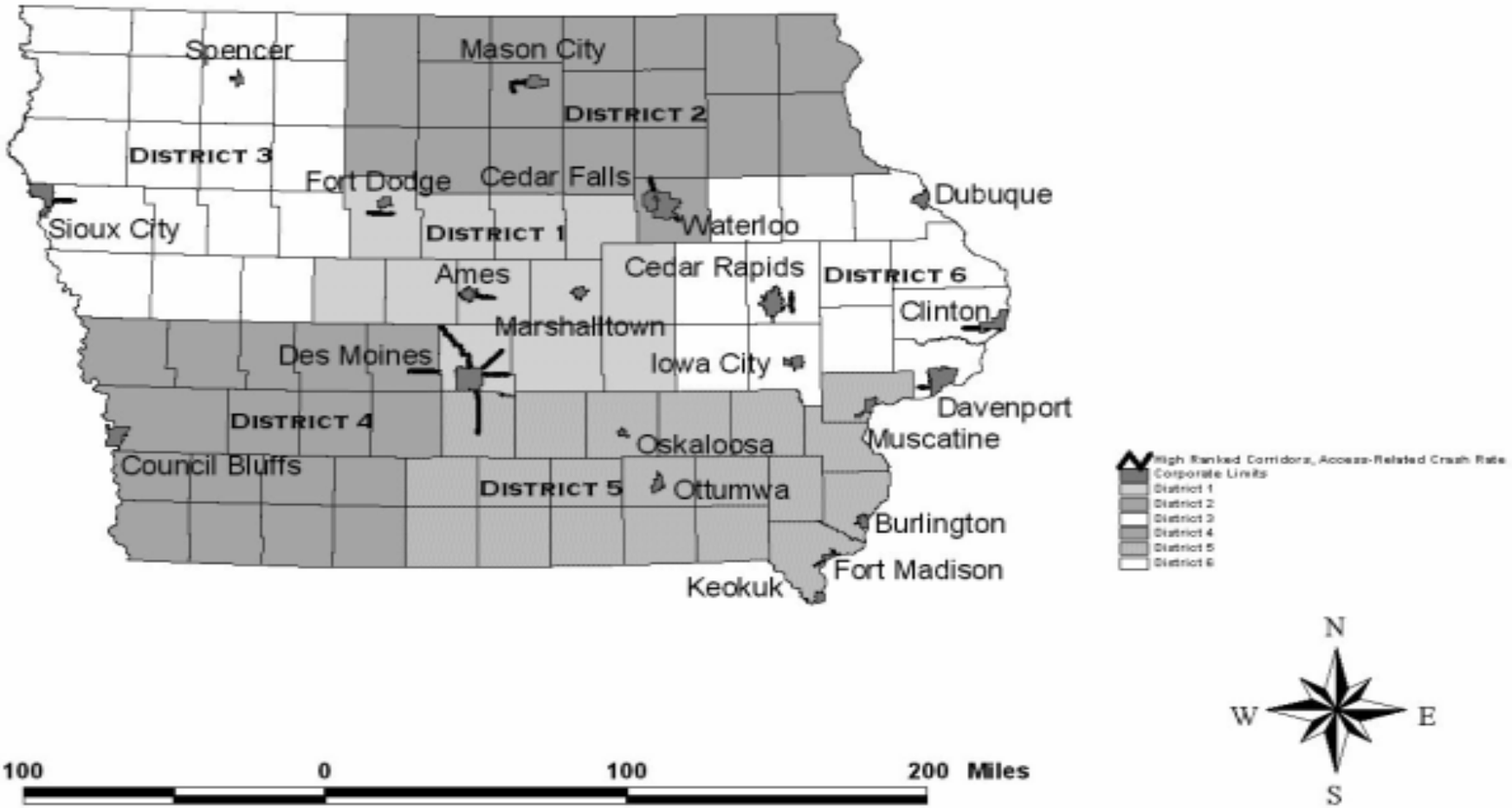
Access-Related Crash Losses On Commuter Routes By Iowa DOT District

District	Losses From Total Crashes	Losses From Access Crashes	Percentage Of Total Crash Losses That Are Access-Related	Percentage Total Access Crash Losses By District
1	$19,266,493,500	$4,132,017,500	21.45%	54.52%
5	$9,171,777,500	$1,698,090,000	18.51%	22.41%
6	$5,818,520,000	$828,232,500	14.23%	10.93%
2	$1,856,240,000	$487,407,500	26.26%	6.43%
4	$1,374,847,500	$352,772,500	25.66%	4.65%
3	$752,072,500	$79,925,000	10.63%	1.05%
Iowa Total	$38,239,951,000	$7,578,445,000	20.00%	100.00%

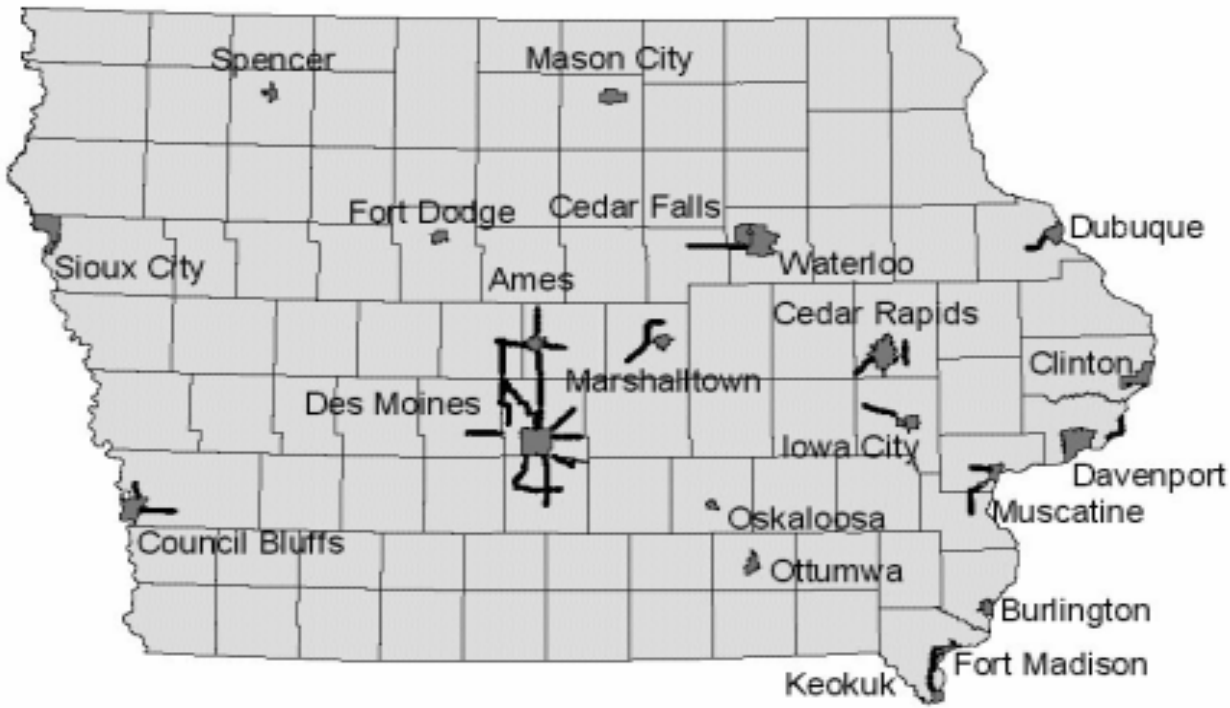
Highest Ranking Four-Lane Or Partially Four-Laned Corridors, Total Crash Rates



Highest Ranking Four-Lane Or Partially Four-Laned Corridors, Access-Related Crash Rates



Iowa Commuter Routes:
Top Ranked Corridors for Potential Improvement



These are the corridors that appeared to have the most potential for reductions in access-related crash losses

Top Ranked Corridors for Potential Improvement
Corporate Limits
State Boundary

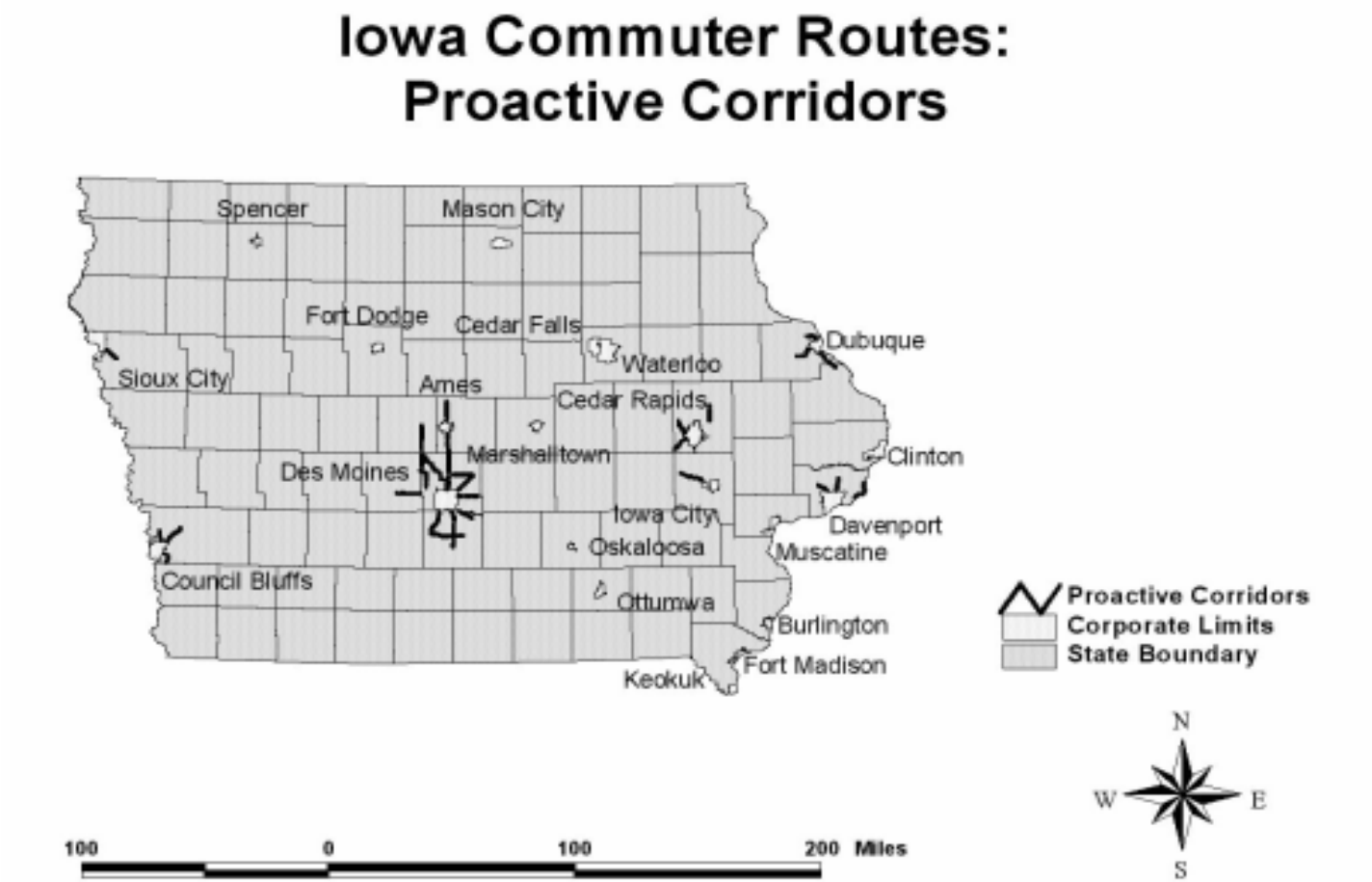
100 0 100 200 Miles

N
W E
S

"Pro-Active Corridors"

- Some corridors may not have access-related crash problems today, but could develop them in the future as urban growth occurs
- "Pro-Active Corridors" were identified based on the following factors:
  - High forecast commuting traffic growth from the traffic model
  - Close proximity to metropolitan and/or urban areas
  - Iowa DOT Access priority ranking of 3, 4, 5, 6, or none
  - High driveway access density (ratio of all driveways per mile, including farm field entrances)

Pro-Active Corridors: Most Likely Future Access Issues



Next Step: Implementing Corridor Management

- Select a small set of corridors that rank high in terms of access problems and where improvement is possible
- Develop pilot or model access management corridor plans and intergovernmental (28E) agreements
  - There is such an effort underway on US 6 in Iowa DOT District 4 near Des Moines now, modeled on Kansas DOT's agreement process for corridor management
  - This corridor management plan will be a "vision" for how the corridor will look in the future, signed off on by both the Iowa DOT (roadway agency) and local governments (land use planning agencies)

Corridor Management Thinking

- Transportation corridors are valuable assets that can be diminished in value through a series of poor access decisions
  - Think of poorly managed access as extra depreciation
- The value of corridors can be partly preserved through access management
- The end result of poor access management is often a very expensive bypass combined with a remaining arterial that still doesn't function very well and that has a high crash rate

Some Critical Access Management Standards For Commuter Corridors

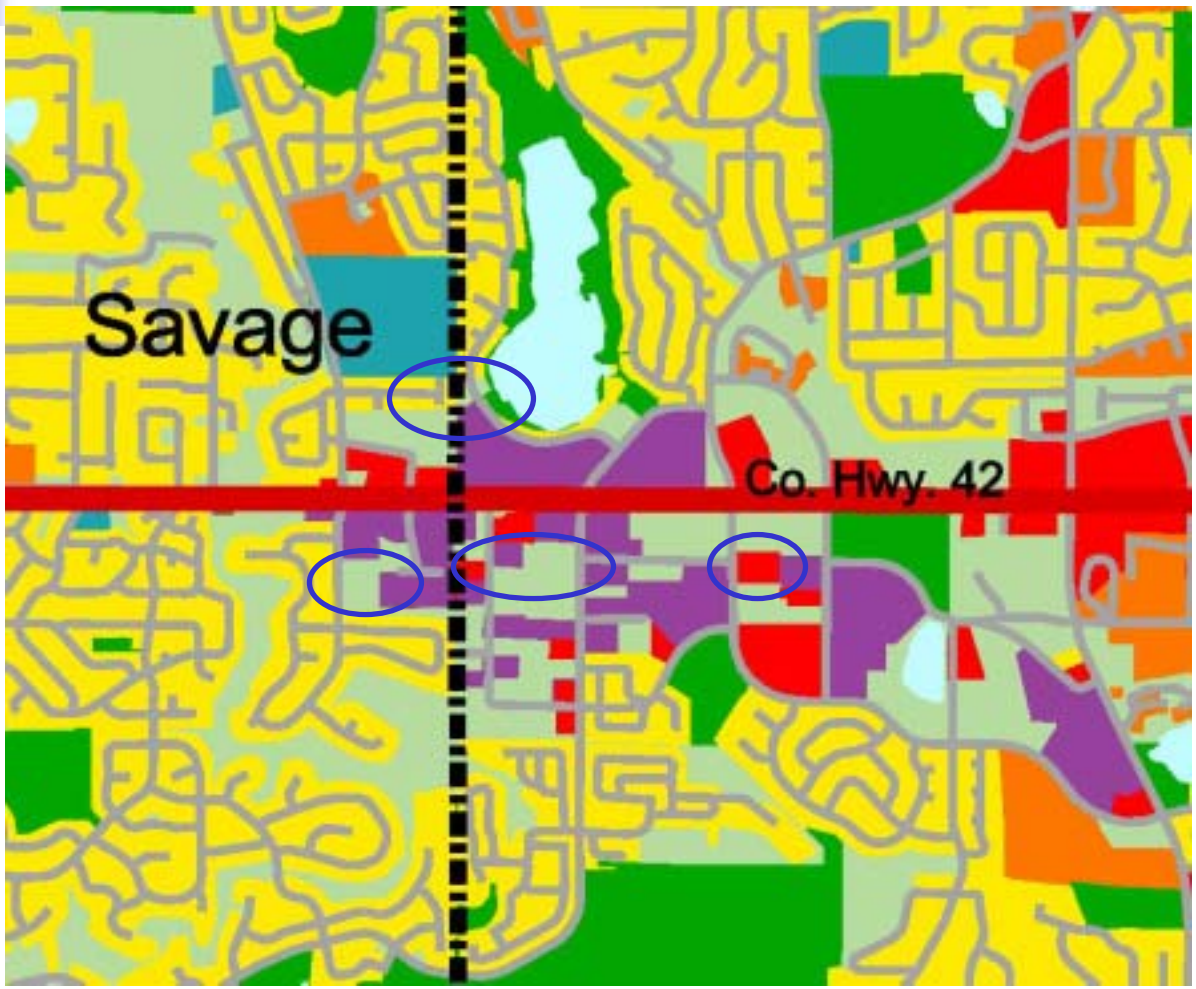
- Clearance of functional areas of interchanges and intersections
- Public road intersection density
- Traffic signal spacing
- Standards for median breaks
- Driveway density and spacing
  - Residential and farm field entrances are less critical than commercial driveways *unless* land use change is expected
- Driveway sight distance
  - This is the major issue on many of the two-lane rural arterials identified in the study
  - Generally not as much of an issue for four-lane routes in Iowa
- Alternative access ways, shared driveways, cross-access, and improved internal circulation in developments

US 6, In The Waukee Area Showing Alternative Access Ways

Coordinating Access Management and Land Use Planning

- Transportation agencies have authority over traffic signals, interchanges, intersections, medians, and driveway entrances
- They *do not* have authority over land use plans, zoning, and subdivision designs or platting
- Staff who manage driveways and other access features need to consult with local land use planners on an ongoing basis (and visa versa)

Example of Poor Coordination of Transportation and Land Use Planning From Twin Cities Area, MN



Presentation Recap

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